

To:

PCT

see form PCT/ISA/220

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference see form PCT/ISA/220		<b>FOR FURTHER ACTION</b> See paragraph 2 below	
International application No. PCT/US2004/000556	International filing date (day/month/year) 10.01.2004	Priority date (day/month/year) 10.01.2003	
International Patent Classification (IPC) or both national classification and IPC B05B5/053, B05B5/025, B05B15/04, B05B5/16			
Applicant BATTELLE MEMORIAL INSTITUTE			

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Authorized Officer
 European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Roldán, J Telephone No. +31 70 340-2740



**Box No. I Basis of the opinion**

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - a sequence listing
    - table(s) related to the sequence listing
  - b. format of material:
    - in written format
    - in computer readable form
  - c. time of filing/furnishing:
    - contained in the international application as filed.
    - filed together with the international application in computer readable form.
    - furnished subsequently to this Authority for the purposes of search.
3.  In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. II Priority

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1.  The following document has not been furnished:

copy of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(a)).  
 translation of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2.  This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

the entire international application,  
 claims Nos. 4-26

because:

- the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
- the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (specify):
- the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- no international search report has been established for the whole application or for said claims Nos. 4-26
- the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
  - the written form  has not been furnished  
 does not comply with the standard
  - the computer readable form  has not been furnished  
 does not comply with the standard
- the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.
- See separate sheet for further details

**Box No. IV Lack of unity of invention**

1.  In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:
  - paid additional fees.
  - paid additional fees under protest.
  - not paid additional fees.
2.  This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is:
  - complied with
  - not complied with for the following reasons:

see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
  - all parts.
  - the parts relating to claims Nos. 1-3

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	
	No: Claims	1-3
Inventive step (IS)	Yes: Claims	
	No: Claims	1-3
Industrial applicability (IA)	Yes: Claims	1-3
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

Re Item IV.

The separate groups of inventions are:

Claims 1-3: Spray head with an array of nozzles a charged electrode and a shroud.  
Claims 4-6: Manifold with equidistant passages.  
Claims 7-12: Spray shaping mechanism with electrodes.  
Claims 13-20,22: Shroud having a particular material and shape.  
Claim 21: Upside down sensor with on/off switch.  
Claims 23,24: Spray head with wheels.  
Claim 25: Spray head with rotating means.  
Claim 26: Spraying system.

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

It is considered that the application does not comply with the requirement of unity of invention (Rule 13.1) for the reasons indicated below:

The definitions of the different (groups of) claimed inventions are only intended to identify said inventions in a concise manner. They may well, as such, comprise terms or generalisations which upon a close analysis could be found to extend the defined subject-matter beyond the contents of the application as filed.

Document D1 (US6302231), which is considered to represent the closest prior art, discloses a sprayer head with a nozzle comprising a manifold having an array of spraying sites, a charged electrode and a shroud that at least partially surrounds the nozzle.

The special technical features, as defined in Rule 13.2 PCT, of the first group of claims, are considered to be a spray head with a nozzle having discrete fluid spray sites and a shroud, solve the problem of providing a wide spray of the spray head.

The special technical features, as defined in Rule 13.2 PCT, of the second group of claims, are considered to be a manifold with passages of the same length, solve the problem of controlling the amount of fluid delivered at each spray site.

The special technical features, as defined in Rule 13.2 PCT, of the third group of claims, are considered to be a spray shaping mechanism, solve the problem of providing a spray with a determined shape.

The special technical features, as defined in Rule 13.2 PCT, of the fourth group of claims, are considered to be a spray head shroud, solve the problem of providing adequate material properties and masking the sprayed area.

The special technical features, as defined in Rule 13.2 PCT, of the fifth group of claims, are considered to be an upside down sensor, solve the problem of switching off the spray in case of wrong positioning.

The special technical features, as defined in Rule 13.2 PCT, of the sixth group of claims, are considered to be a spray head with wheels, solve the problem of translocating the device.

The special technical features, as defined in Rule 13.2 PCT, of the seventh group of claims, are considered to be a spray head with rotating means, solve the problem of orientating the head towards the target.

The special technical features, as defined in Rule 13.2 PCT, of the eighth group of claims, are considered to be a spraying system with a pump and a control panel, solve the problem of supplying the fluid to the sprayer head.

These special technical features are neither identical (see above) nor corresponding since they are directed to solving different problem (see above). Therefore the application is considered to lack the required unity.

**Re Item V.**

1 The following document is referred to in this communication:

D1 : US 6 302 331 B1 (CHONGSIRIWATANA SONGSDHIT ET AL) 16 October 2001

**2 INDEPENDENT CLAIM 1**

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Document D1 discloses (the references in parenthesis applying to this document):

A spray head (100) for use with an electrohydrodynamic spray device, wherein said spray head comprises

at least one nozzle (120) configured to provide a charged aerosol from a liquid formulation, said nozzle comprising a manifold (190) having at least one fluid entrance (column 15 lines 63-65) and one or more discrete fluid spray sites (120); and a shroud (110) that at least partially surrounds said nozzle.

### 3 DEPENDENT CLAIMS 2, 3

Dependent claims 2, 3 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty (Article 33(2) PCT).

3.1 Document D1 discloses (the references in parenthesis applying to this document):

A spray head wherein said fluid spray sites are arranged in a linear array, non-linear array or combination thereof (column 12 lines 29-37, figures).

3.2 Document D1 discloses (the references in parenthesis applying to this document):

A spray head comprising a charged electrode (180) in communication with said fluid spray sites.